NEXCOM International Co., Ltd.

Industrial Computing Solutions

Embedded Computing (3.5” CPU Board)

EBC 352

User Manual

NEXCOM International Co., Ltd.
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www.nexcom.com

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PREFACE

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Acknowledgements

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Regulatory Compliance Statements

This section provides the FCC compliance statement for Class A devices and describes how to keep the system CE compliant.

Declaration of Conformity

FCC

This equipment has been tested and verified to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area (domestic environment) is likely to cause harmful interference, in which case the user will be required to correct the interference (take adequate measures) at their own expense.

CE

The product(s) described in this manual complies with all applicable European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

RoHS Compliance



NEXCOM RoHS Environmental Policy and Status Update

NEXCOM is a global citizen for building the digital infrastructure. We are committed to providing green products and services, which are compliant with European Union RoHS (Restriction on Use of Hazardous Substance in Electronic Equipment) directive 2002/95/EU, to be your trusted green partner and to protect our environment.

RoHS restricts the use of Lead (Pb) < 0.1% or 1,000ppm, Mercury (Hg) < 0.1% or 1,000ppm, Cadmium (Cd) < 0.01% or 100ppm, Hexavalent Chromium (Cr6+) < 0.1% or 1,000ppm, Polybrominated biphenyls (PBB) < 0.1% or 1,000ppm, and Polybrominated diphenyl Ethers (PBDE) < 0.1% or 1,000ppm.

In order to meet the RoHS compliant directives, NEXCOM has established an engineering and manufacturing task force in to implement the introduction of green products. The task force will ensure that we follow the standard NEXCOM development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which NEXCOM are renowned.

The model selection criteria will be based on market demand. Vendors and suppliers will ensure that all designed components will be RoHS compliant.

How to recognize NEXCOM RoHS Products?

For existing products where there are non-RoHS and RoHS versions, the suffix "(LF)" will be added to the compliant product name.

All new product models launched after January 2006 will be RoHS compliant. They will use the usual NEXCOM naming convention.

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Warranty and RMA

NEXCOM Warranty Period

NEXCOM manufactures products that are new or equivalent to new in accordance with industry standard. NEXCOM warrants that products will be free from defect in material and workmanship for 2 years, beginning on the date of invoice by NEXCOM. HCP series products (Blade Server) which are manufactured by NEXCOM are covered by a three year warranty period.

NEXCOM Return Merchandise Authorization (RMA)

- Customers shall enclose the "NEXCOM RMA Service Form" with the returned packages.
- Customers must collect all the information about the problems encountered and note anything abnormal or, print out any on-screen messages, and describe the problems on the "NEXCOM RMA Service Form" for the RMA number apply process.
- Customers can send back the faulty products with or without accessories (manuals, cable, etc.) and any components from the card, such as CPU and RAM. If the components were suspected as part of the problems, please note clearly which components are included. Otherwise, NEXCOM is not responsible for the devices/parts.
- Customers are responsible for the safe packaging of defective products, making sure it is durable enough to be resistant against further damage and deterioration during transportation. In case of damages occurred during transportation, the repair is treated as "Out of Warranty."
- Any products returned by NEXCOM to other locations besides the customers' site will bear an extra charge and will be billed to the customer.

Repair Service Charges for Out-of-Warranty Products

NEXCOM will charge for out-of-warranty products in two categories, one is basic diagnostic fee and another is component (product) fee.

System Level

- Component fee: NEXCOM will only charge for main components such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistor, capacitor.
- Items will be replaced with NEXCOM products if the original one cannot be repaired. Ex: motherboard, power supply, etc.
- Replace with 3rd party products if needed.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Board Level

- Component fee: NEXCOM will only charge for main components, such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistors, capacitors.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

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Warnings

Read and adhere to all warnings, cautions, and notices in this guide and the documentation supplied with the chassis, power supply, and accessory modules. If the instructions for the chassis and power supply are inconsistent with these instructions or the instructions for accessory modules, contact the supplier to find out how you can ensure that your computer meets safety and regulatory requirements.

Cautions

Electrostatic discharge (ESD) can damage system components. Do the described procedures only at an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the computer chassis.

Safety Information

Before installing and using the device, note the following precautions:

- Read all instructions carefully.
- Do not place the unit on an unstable surface, cart, or stand.
- Follow all warnings and cautions in this manual.
- When replacing parts, ensure that your service technician uses parts specified by the manufacturer.
- Avoid using the system near water, in direct sunlight, or near a heating device.
- The load of the system unit does not solely rely for support from the rackmounts located on the sides. Firm support from the bottom is highly necessary in order to provide balance stability.
- The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Installation Recommendations

Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:

- A Philips screwdriver
- A flat-tipped screwdriver
- A grounding strap
- An anti-static pad

Using your fingers can disconnect most of the connections. It is recommended that you do not use needlenose pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

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Safety Precautions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect the equipment from an AC power outlet prior to installing a component inside the chassis.
4. To prevent electrostatic build-up, leave the board in its anti-static bag until you are ready to install it.
5. Keep the board away from humidity.
6. Put the board on a stable surface. Dropping it or letting it fall may cause damage.
7. Do not leave the board in either an unconditioned environment or in a above 60°C storage temperature as this may damage the board.
8. Wear an antistatic wrist strap.
9. Do all preparation work on a static-free surface.
10. Hold the board only by its edges. Be careful not to touch any of the components, contacts or connections.
11. All cautions and warnings on the board should be noted.
12. Use the correct mounting screws and do not over tighten the screws.
13. Keep the original packaging and the anti-static bag; in case the board has to be returned for repair or replacement.

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Technical Support and Assistance

1. For the most updated information of NEXCOM products, visit NEXCOM's website at www.nexcom.com.

2. For technical issues that require contacting our technical support team or sales representative, please have the following information ready before calling:
   - Product name and serial number
   - Detailed information of the peripheral devices
   - Detailed information of the installed software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wordings of the error messages

Conventions Used in this Manual



Warning: Information about certain situations, which if not observed, can cause personal injury. This will prevent injury to yourself when performing a task.



Caution: Information to avoid damaging components or losing data.



Note: Provides additional information to complete a task easily.

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Package Contents

Before continuing, verify that the EBC 352 package that you received is complete. Your package should have all the items listed in the following table.

Item	Part Number	Name	Description	Qty
1	60233USB59X00	USB CABLE EDI:262082060204-RS	DUAL PORT USB CON TO JST 6PIN 2.0mm L:200+-10mm	1
2	60233PS203X00	EBC563IO PS2 KB/MS CABLE EDI:201061080201-RS	PS2 TO JST 8PIN 2.54mm L:200mm+-10mm	1
3	6023309101X00	CABLE EDI:13220902611-RS	COM PORT. 9PIN TO HOUSING 10PIN PIT:2.0mm L:260mm	1
4	60233PW148X00	SATA POWER CABLE BEST:901-0405-300R	HOUSING 4P TO HOUSING 5P L:300mm	1

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Ordering Information

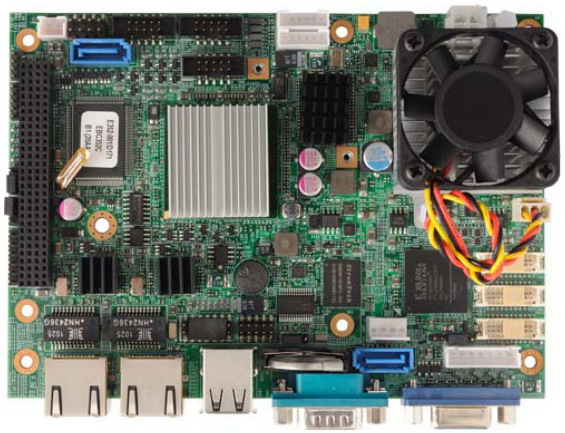
The following provides ordering information for EBC 352.

- **EBC 352 (P/N: 10E00035200X0) RoHS Compliant**
  Low power Embedded Board with Intel® Atom™ Dual Core D525 processor supports DDR3 SODIMM memory module.

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Chapter 1: Product Introduction

Overview



Key Features

- Onboard Intel® Atom™ Dual Core D525 CPU
- Supports DDR3 SODIMM SDRAM, up to 2GB
- Supports VGA/LVDS 18/24-bit display
- Dual Intel® Gigabit Ethernet
- Supports PCI 104, 1x Mini PCI Express socket
- 4x COMs, 6x USB 2.0
- Single DC 12V power input

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Hardware Specifications

CPU
- Onboard Intel® Atom™ Dual Core D525 (1.8GHz, 1M Cache) processor

Chipset
- Intel® NH82801HBM (ICH8M)

Main Memory
- 1x 204-pin DDR3 SODIMM socket
- Supports up to 2GB DDR3 800MHz memory; non-ECC and unbuffered

BIOS
- AMI BIOS
- Plug & Play support
- Advanced Power Management
- Advanced Configuration & Power Interface
- 8Mbits SPI ROM

Onboard LAN
- 2x Intel® GbE LAN controllers
- Supports Boot From LAN (PXE) and Wake on LAN (WoL)
- 2x RJ45 with LED

Display
- Intel® D425/D525 integrated graphic engine
  - Supports DirectX 9, with Intel Clear Video Technology on MPEG2 Hardware Acceleration
- Analog VGA interface
  - 1x DB15 VGA port
  - Supports up to 2048x1563@ 60Hz resolution
- 2x DF-13 20-pin LVDS connector
  - Supports single (24-bit) or dual (48-bit) LVDS panel
- CCFL interface
  - 1x 7-pin JST connector
  - 5V or 12V power source to enable LCD Panel backlight Inverter

Onboard Audio
- Realtek ALC888 HD CODEC
- 1x Mic-in and 1x Line-out pin header

Expansion
- 1x Mini PCIe socket

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I/O Interface
- Serial ports: 4 ports
  - 1x RS232 DB-9 connector
  - 2x RS232 10-pin box headers, 2.0mm pitch
  - 1x RS232/422/485 (COM2) 10-pin box header, 2.0mm pitch
- USB 2.0: 6 ports
  - 2x USB 2.0 connectors
  - 4x via internal JST connectors
  - 8x GPIO, 10-pin pin header, (GPI 0~3 and GPO 0~3) with TTL Level (0/5V)
- Onboard Power LED and HDD Active LED pin header
- 1x 3-pin fan connector (for CPU)
- 1x Keyboard/Mouse pin header
- Onboard Buzzer/ SMBus2.0/ Reset SW

Watchdog Timer
- Watchdog timeout is programmable by software from 1 sec to 255 sec and from 1 min to 255 minutes (Tolerance 15% under 25°C room temperature)

Storage
- 2x SATA connectors (support 2.5" HDD and SATA DOM)
- 1x CF socket

System Monitor
- Monitors 4 voltages and 2 temperatures
- 4 voltages (Vcore, +12V, +3.3V, +5V)
- 2 temperatures (CPU and system)

Onboard RTC
- On-chip RTC with battery backup
- 1 x External Li-Ion battery

Power Input
- Supports AT and ATX modes (default: ATX)

Power Requirements
- Power requirement: +12V DC input
- One 4-pin power connector

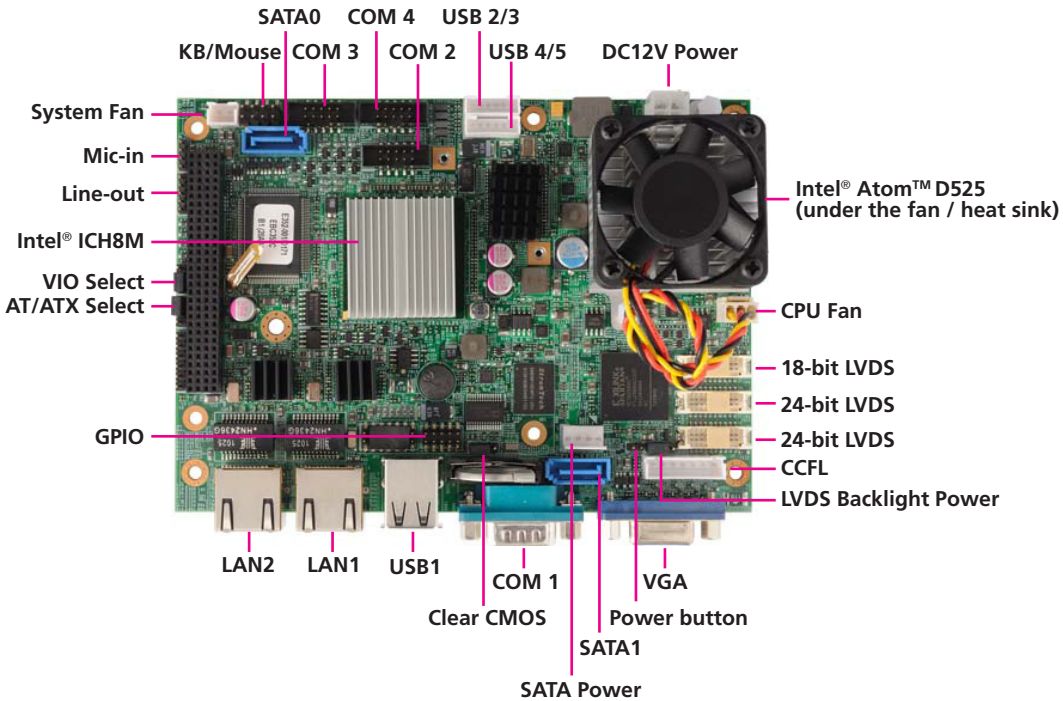
Dimensions
- 3.5" form factor
- 146mm (L) x 105mm (W) (5.7"x 4.1")

Environment
- Operating temperature: 0°C to 60°C
- Storage temperature: -20°C to 85°C
- Operating Relative Humidity: 10% - 90%, non condensing

Certifications
- CE approval
- FCC Class A

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Getting to Know EBC 352



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Chapter 2: Jumpers and Connectors

This chapter describes how to set the jumpers and connectors on the motherboard. Note that the following procedures are generic for EBC 352.

Before You Begin

- Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.
- Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:
  - A Philips screwdriver
  - A flat-tipped screwdriver
  - A set of jewelers Screwdrivers
  - A grounding strap
  - An anti-static pad
- Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nosed pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.
- Before working on internal components, make sure that the power is off. Ground yourself before touching any internal components, by touching a metal object. Static electricity can damage many of the electronic components. Humid environment tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

Precautions

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on the computers that are still connected to a power supply can be extremely dangerous.

Follow the guidelines below to avoid damage to your computer or yourself:

- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.
- Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Don't flex or stress the circuit board.
- Leave all components inside the static-proof packaging that they shipped with until they are ready for installation.
- Use correct screws and do not over tighten screws.

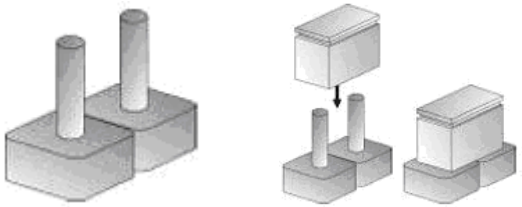
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Jumper Settings

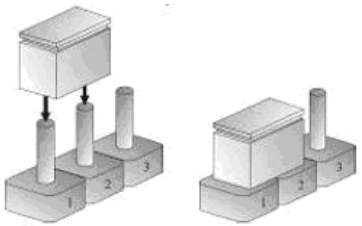
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is **short**. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is **open**.

Refer to the illustrations below for examples of what the 2-pin and 3-pin jumpers look like when they are short (on) and open (off).

Two-Pin Jumpers: Open (Left) and Short (Right)



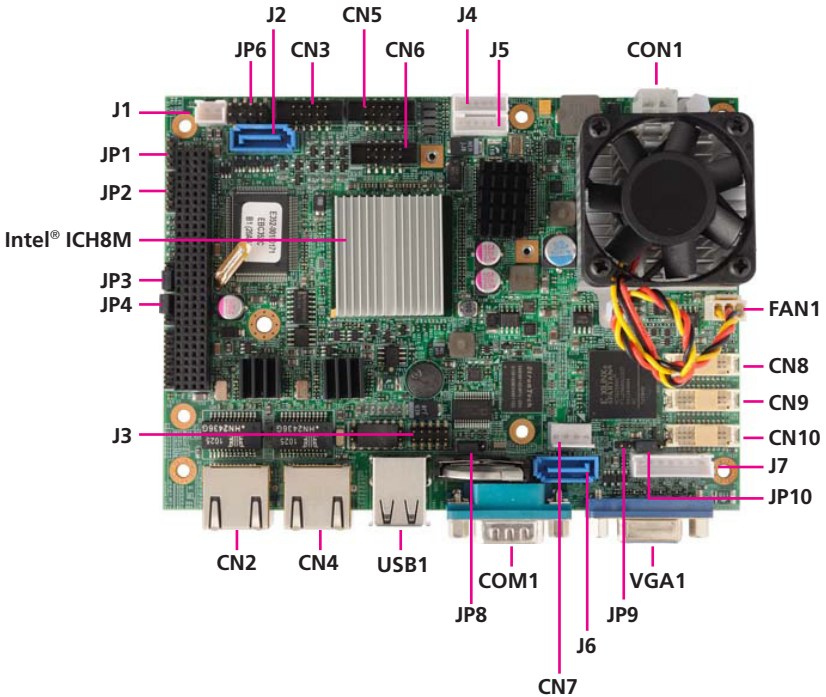
Three-Pin Jumpers: Pins 1 and 2 Are Short



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Locations of the Jumpers and Connectors

The figure below shows the locations of the jumpers and connectors.



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Jumpers

VIO Select

Connector type: 1x3 3-pin header, 2.54 mm pitch
Connector location: JP3



Pin	Definition
1-2	VCC3
2-3	VCC5

1-2 On: default

RTC Clear

Connector type: 1x3 3-pin header, 2.54 mm pitch
Connector location: JP8



Pin	Settings
1-2 On	Normal
2-3 On	CMOS Clear

1-2 On: default

Pin	Definition
1	Battery 3.3V
2	RTCRST#
3	GND

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Power Type Select

Connector type: 1x3 3-pin header, 2.54 mm pitch
Connector location: JP4



Pin	Definition
1-2 On	AT Mode
2-3 On	ATX Mode

2-3 On: default

LVDS Backlight Power Select

Connector type: 1x3 3-pin header, 2.54 mm pitch
Connector location: JP10



Pin	Definition
1-2 On	3.3V
2-3 On	5V

1-2 On: default

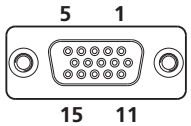
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Connector Pin Definitions

External I/O Interfaces

VGA Port

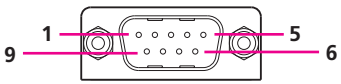
Connector type: DB-15 port, 15-pin D-Sub
Connector location: VGA1



Pin	Definition	Pin	Definition
1	Red	9	+5V
2	Green	10	GND
3	Blue	11	N/C
4	N/C	12	DDC Data
5	GND	13	HSYNC
6	VGADET	14	VSYNC
7	GND	15	DDC Clock
8	GND		

COM 1 Port

Connector type: DB-9 port, 9-pin D-Sub
Connector location: COM1

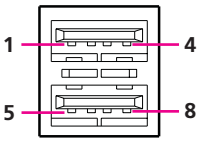


Pin	Definition	Pin	Definition
1	DCD1	2	RXD1
3	TXD1	4	DTR1
5	GND	6	DSR1
7	RTS1	8	CTS1
9	RI1		

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USB Ports

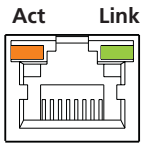
Connector type: Dual USB port, Type A
Connector location: USB1



Pin	Definition	Pin	Definition
1	VCC5	5	VCC5
2	USB0-	6	USB1-
3	USB0+	7	USB1+
4	GND	8	GND

LAN1 and LAN2 Ports

Connector type: RJ45 ports with LEDs
Connector location: CN2 and CN4



Pin	Definition	Pin	Definition
1	M0+	7	M3+
2	M0-	8	M3-
3	M1+	9	LEDACT#
4	M2+	10	+3VSB
5	M2-	MH1	GND
6	M1-	MH2	GND

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Internal Connectors

System Fan Connector

Connector type: 1x2 JST, 2-pin header, 2.5 mm pitch
Connector location: J1



Pin	Definition
1	VCC5
2	GND

CPU Fan Connector

Connector type: 1x3 3-pin Wafer, 2.54 mm pitch
Connector location: FAN1

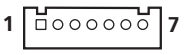


Pin	Definition
1	GND
2	+12V
3	SENSE

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LVDS Panel Backlight Connector

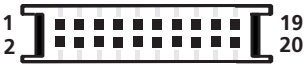
Connector type: 1x7 JST, 7-pin header, 2.5 mm pitch
Connector location: J7



Pin	Definition
1	+5V
2	+12V
3	+12V
4	Panel Backlight Brightness Control
5	GND
6	GND
7	Panel Backlight Enable

LVDS Connector

Connector type: 2x10 20-pin, 1.25 mm pitch
Connector location: CN8

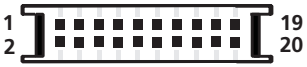


Pin	Definition	Pin	Definition
1	DDC_CLK	11	RXCLK+
2	DDC_DATA	12	RX1-
3	VCC_LCD	13	RXCLK-
4	RX0+	14	GND
5	N/A	15	GND
6	RX0-	16	V_INV
7	N/A	17	RX2+
8	VCC_LCD	18	V_INV
9	GND	19	RX2-
10	RX1+	20	GND

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LVDS Connector

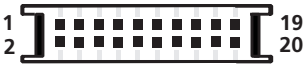
Connector type: 2x10 20-pin, 1.25 mm pitch
Connector location: CN9



Pin	Definition	Pin	Definition
1	DDC_CLK	11	RXCLK+
2	DDC_DATA	12	RX1-
3	VCC_LCD	13	RXCLK-
4	RX0+	14	GND
5	RX3+	15	GND
6	RX0-	16	V_INV
7	RX3-	17	RX2+
8	VCC_LCD	18	V_INV
9	GND	19	RX2-
10	RX1+	20	GND

LVDS Connector

Connector type: 2x10 20-pin, 1.25 mm pitch
Connector location: CN10



Pin	Definition	Pin	Definition
1	DDC_CLK	11	RXCLK+
2	DDC_DATA	12	RX1-
3	VCC_LCD	13	RXCLK-
4	RX0+	14	GND
5	RX3+	15	GND
6	RX0-	16	V_INV
7	RX3-	17	RX2+
8	VCC_LCD	18	V_INV
9	GND	19	RX2-
10	RX1+	20	GND

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USB 2/3 Connector

Connector type: 1x6 6-pin boxed header, JST-2.0mm-M-180
Connector location: J4



Pin	Definition
1	+5V
2	Data 4-
3	Data 4+
4	Data 5-
5	Data 5+
6	GND

USB 4/5 Connector

Connector type: 1x6 6-pin boxed header, JST-2.0mm-M-180
Connector location: J5

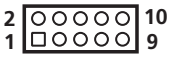


Pin	Definition
1	+5V
2	Data 2-
3	Data 2+
4	Data 3-
5	Data 3+
6	GND

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GPIO Connector

Connector type: 2x5 10-pin header, 2.0 mm pitch
Connector location: J3



Pin	Definition	Pin	Definition
1	+5V	2	GND
3	GPIO24(Pin58)	4	GPIO20(Pin52)
5	GPIO25(Pin59)	6	GPIO21(Pin54)
7	GPIO26(Pin60)	8	GPIO22(Pin56)
9	GPIO27(Pin61)	10	GPIO23(Pin57)

Power Button Connector

Connector type: 1x2 2-pin header, 2.54 mm pitch
Connector location: JP9

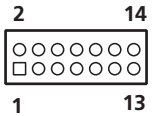


Pin	Definition
1	GND
2	PWRBT#_CHARGE

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LED Connector

Connector type: 2x7 14-pin header 2.54mm-M-180
Connector location: JP7



Pin	Description	Pin	Description
1	PWR_LED_N	2	PWR_LED_P
3	HDD_LED_N	4	HDD_LED_P
5	LAN1_LEDACT#	6	LAN1_ACT
7	LAN1_LINK#	8	LAN1_LINK
9	LAN2_LEDACT#	10	LAN2_ACT
11	LAN2_LINK#	12	LAN2_LINK
13	I_RESET#JP	14	GND

Line-out Connector

Connector type: 1x5 5-pin header, 2.0 mm pitch
Connector location: JP2



Pin	Definition
1	AUDIO-OUT-LR+
2	AUDIO-OUT-LR-
3	GND
4	AUDIO-OUT-RR+
5	AUDIO-OUT-RR-

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Mic-in Connector

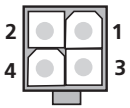
Connector type: 1x4 4-pin header, 2.0 mm pitch
Connector location: JP1



Pin	Definition
1	MIC1_L
2	GND
3	GND
4	MIC1_R

Power Connector

Connector type: 2x2
Connector location: CON1



Pin	Definition
1	GND
2	GND
3	+V12SB
4	+V12SB

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SATA 0 Connector

Connector type: 7-pin, 1.27mm, Standard Serial ATAII
Connector location: J2



Pin	Definition
1	GND
2	TXP0
3	TXN0
4	GND
5	RXN0
6	RXP0
7	GND

SATA 1 Connector

Connector type: 7-pin, 1.27mm, Standard Serial ATAII
Connector location: J6



Pin	Definition
1	GND
2	TXP1
3	TXN1
4	GND
5	RXN1
6	RXP1
7	GND

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SATA Power Connector

Connector type: 1x4 4-pin Wafer, 2.54 mm pitch
Connector location: CN7



Pin	Definition
1	+12
2	GND
3	GND
4	VCC5

SATA DOM Power Connector

Connector type: 1x2 JST, 2-pin header, 2.5 mm pitch
Connector location: J1

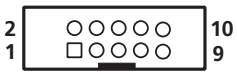


Pin	Definition
1	VCC5
2	GND

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COM 2 Connector

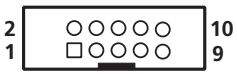
Connector type: 2x5 10-pin boxed header, 2.0 mm
Connector location: CN6



Pin	Definition	Pin	Definition
1	DCD2	2	RXD2
3	TXD2	4	DTR2
5	GND	6	DSR2
7	RTS2	8	CTS2
9	RI2	10	GND

COM 3 Connector

Connector type: 2x5 10-pin boxed header, 2.0 mm
Connector location: CN3

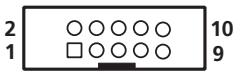


Pin	Definition	Pin	Definition
1	DCD3	2	RXD3
3	TXD3	4	DTR3
5	GND	6	DSR3
7	RTS3	8	CTS3
9	RI3	10	GND

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COM 4 Connector

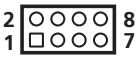
Connector type: 2x5 10-pin boxed header, 2.0 mm
Connector location: CN5



Pin	Definition	Pin	Definition
1	DCD4	2	RXD4
3	TXD4	4	DTR4
5	GND	6	DSR4
7	RTS4	8	CTS4
9	RI4	10	GND

PS/2 Keyboard/Mouse Connector

Connector type: 2x4 8-pin header, 2.54 mm
Connector location: JP6

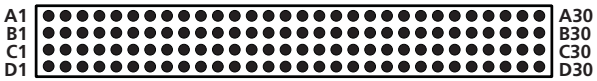


Pin	Definition	Pin	Definition
1	KBMSVCC	2	KBMSVCC
3	LKBDAT	4	LMDAT
5	LKBCLK	6	LMCLK
7	GND	8	GND

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PCI 104 Slot

Connector type: 120-pin connector
Connector location: CN1



Pin	Definition	Pin	Definition
A1	GND	C1	VCC5
A2	VI/O	C2	Address and Data 1
A3	Address and Data 5	C3	Address and Data 4
A4	I_PCICBE#0	C4	GND
A5	GND	C5	Address and Data 8
A6	Address and Data 11	C6	Address and Data 10
A7	Address and Data 14	C7	GND
A8	VCC3	C8	Address and Data 15
A9	I_PCISERR#	C9	N/A
A10	GND	C10	VCC3
A11	I_PCISTOP#	C11	I_PCILOCK#
A12	VCC3	C12	GND
A13	I_PCIFRAME#	C13	I_PCIIRDY#
A14	GND	C14	VCC3
A 15	Address and Data 18	C15	Address and Data 17
A 16	Address and Data 21	C16	GND
A 17	VCC3	C17	Address and Data 22
A 18	PCI_IDSEL0	C18	PCI_IDSEL1

Pin	Definition	Pin	Definition
A19	Address and Data 24	C19	VI/O
A20	GND	C20	Address and Data 25
A21	Address and Data 29	C21	Address and Data 28
A22	VCC5	C22	GND
A23	I_PCIREQ#0	C23	I_PCIREQ#1
A24	GND	C24	VCC5
A25	I_PCIGNT#1	C25	I_PCIGNT#2
A26	VCC5	C26	GND
A27	G_PCICLK2	C27	G_PCICLK3
A28	GND	C28	VCC5
A29	+12V	C29	PCI_SLOT_IRQ#1
A30	-12V	C30	I_PCIGNT#3
B1	N/A	D1	Address and Data 0
B2	Address and Data 2	D2	VCC5
B3	GND	D3	Address and Data 3
B4	Address and Data 7	D4	Address and Data 6
B5	Address and Data 9	D5	GND
B6	VI/O	D6	GND

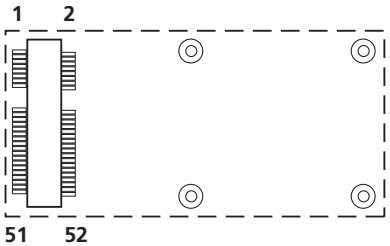
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Pin	Definition	Pin	Definition
B7	Address and Data 13	D7	Address and Data 12
B8	I_PCICBE#1	D8	VCC3
B9	GND	D9	I_PCIPAR
B10	I_PCIPERR#	D10	N/A
B11	VCC3	D11	GND
B12	I_PCITRDY#	D12	I_PCIDEVSEL#
B13	GND	D13	VCC3
B14	Address and Data 16	D14	I_PCICBE#2
B15	VCC3	D15	GND
B16	Address and Data 20	D16	Address and Data 19
B17	Address and Data 23	D17	VCC3
B18	GND	D18	PCI_IDSEL2
B19	I_PCICBE#3	D19	PCI_IDSEL3
B20	Address and Data 26	D20	GND
B21	VCC5	D21	Address and Data 27
B22	Address and Data 30	D22	Address and Data 31
B23	GND	D23	VI/O
B24	I_PCIREQ#2	D24	I_PCIGNT#0
B25	VI/O	D25	GND
B26	G_PCICLK0	D26	G_PCICLK1
B27	VCC5	D27	GND
B28	PCI_SLOT_IRQ#3	D28	I_PCIRST#
B29	PCI_SLOT_IRQ#0	D29	PCI_SLOT_IRQ#2
B30	I_PCIREQ#3	D30	GND
MH1	GND	MH2	GND
MH3	GND	MH4	GND

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Mini PCIe Slot

Connector location: CN11



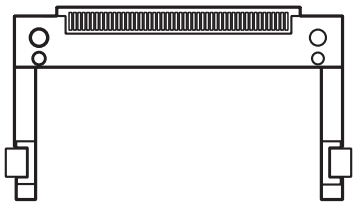
Pin	Definition	Pin	Definition
1	PCIEWAKE#	27	GND
2	+3VSB	28	+1.5V
3	N/A	29	GND
4	GND	30	SMBCLK
5	N/A	31	PCIETX3-
6	+1.5V	32	SMBDATA
7	CLKREQ#	33	PCIETX3+
8	N/A	34	GND
9	GND	35	GND
10	N/A	36	USB_D-
11	REF CLK-	37	GND
12	N/A	38	USB_D+
13	REF CLK+	39	+3VSB
14	N/A	40	GND
15	GND	41	+3VSB

Pin	Definition	Pin	Definition
16	N/A	42	N/A
17	N/A	43	GND
18	GND	44	N/A
19	N/A	45	N/A
20	Disable#	46	N/A
21	GND	47	N/A
22	PERST#	48	+1.5V
23	PCIERX3-	49	N/A
24	+3VSB	50	GND
25	PCIERX3+	51	N/A
26	GND	52	+3VSB
MH1	GND	MH4	GND
MH2	GND	MH5	GND
MH3	GND	MH6	GND

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CompactFlash Socket

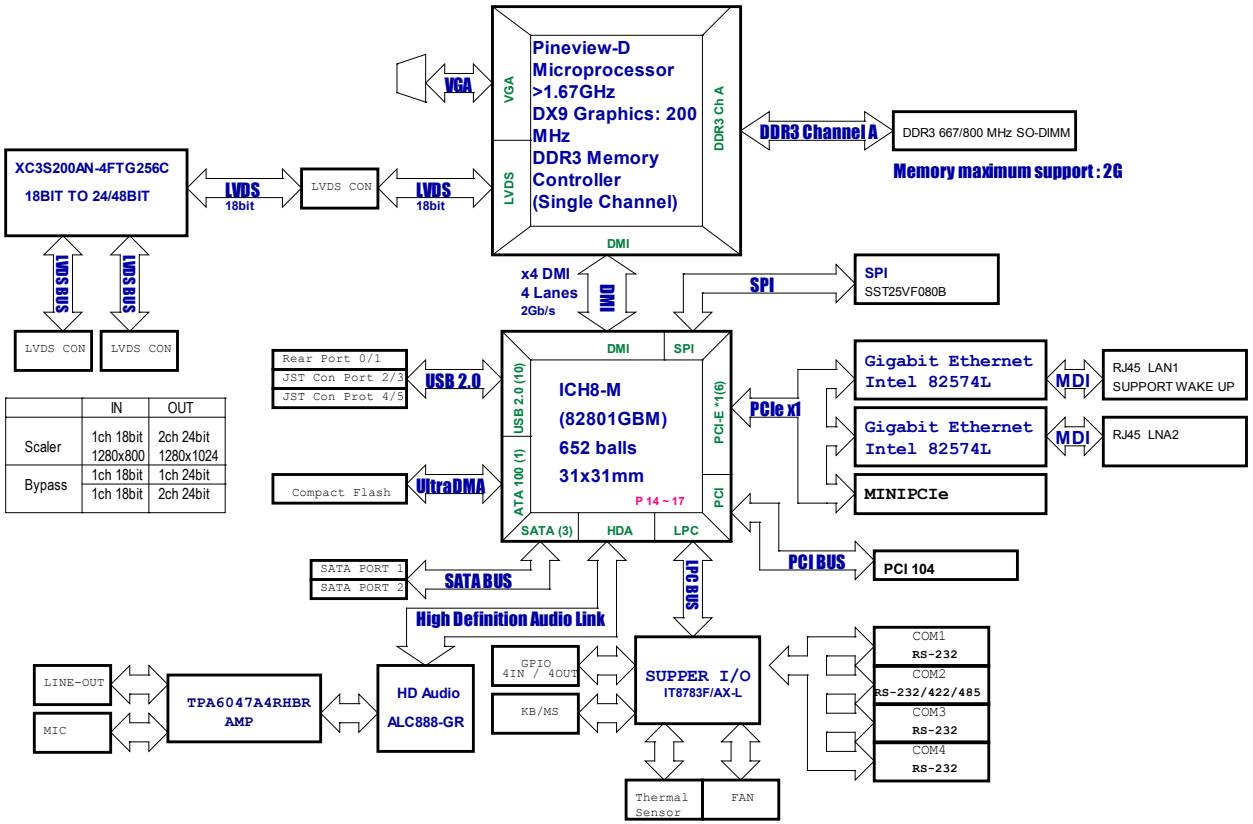
Connector type: 1x50, 50-pin CompactFlash Type 2 socket
Connector location: CN12



Pin	Description	Pin	Description
1	GND	2	SDD3A
3	SDD4A	4	SDD5A
5	SDD6A	6	SDD7A
7	SDCS#1	8	GND
9	GND	10	GND
11	GND	12	GND
13	VCC	14	GND
15	GND	16	GND
17	GND	18	SDA2A
19	SDA1A	20	SDA0A
21	SDD0A	22	SDD1A
23	SDD2A	24	NC
25	CF_CD2#	26	CF_CD1#
27	SDD11A	28	SDD12A
29	SDD13A	30	SDD14A
31	SDD15A	32	SDCS#3
33	NC	34	SDIOR#
35	SDIOW#	36	VCC
37	HDIRQ14	38	VCC
39	CF_SEL#	40	NC
41	IDERST#	42	SIORDY
43	SDREQ	44	SDDACK#
45	IDEACTP#	46	DIAG#
47	SDD8A	48	SDD9A
49	SDD10A	50	GND

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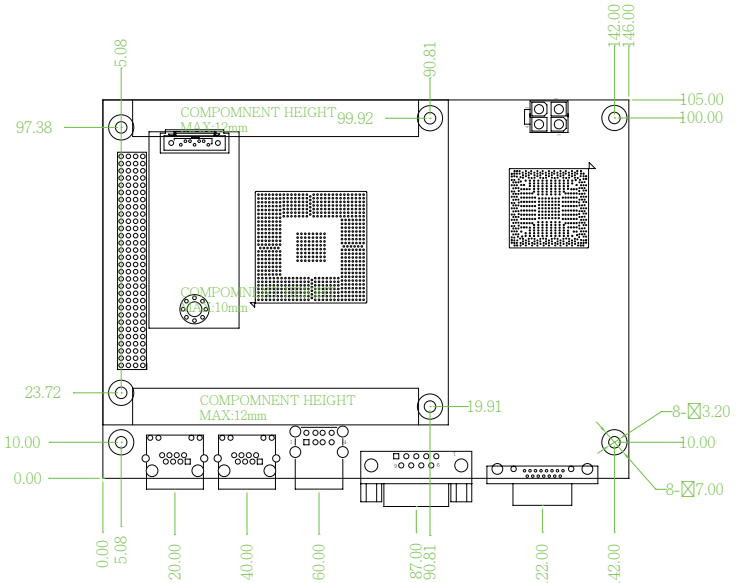
Block Diagram

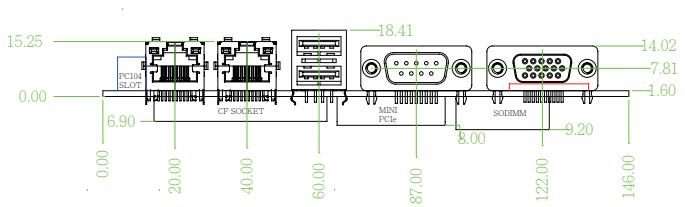


	IN	OUT
Scaler	1ch 18bit 1280x800	2ch 24bit 1280x1024
Bypass	1ch 18bit 1ch 18bit	1ch 24bit 2ch 24bit

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Board Dimensions





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Chapter 3: BIOS Setup

This chapter describes how to use the BIOS setup program for EBC 352. The BIOS screens provided in this chapter are for reference only and may change if the BIOS is updated in the future.

To check for the latest updates and revisions, visit the NEXCOM Web site at www.nexcom.com.tw.

About BIOS Setup

The BIOS (Basic Input and Output System) Setup program is a menu driven utility that enables you to make changes to the system configuration and tailor your system to suit your individual work needs. It is a ROM-based configuration utility that displays the system's configuration status and provides you with a tool to set system parameters.

These parameters are stored in non-volatile battery-backed-up CMOS RAM that saves this information even when the power is turned off. When the system is turned back on, the system is configured with the values found in CMOS.

With easy-to-use pull down menus, you can configure such items as:

- Hard drives, diskette drives, and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power management features

The settings made in the setup program affect how the computer performs. It is important, therefore, first to try to understand all the Setup options, and second, to make settings appropriate for the way you use the computer.

When to Configure the BIOS

This program should be executed under the following conditions:

- When changing the system configuration
- When a configuration error is detected by the system and you are prompted to make changes to the Setup program
- When resetting the system clock
- When redefining the communication ports to prevent any conflicts
- When making changes to the Power Management configuration
- When changing the password or making other changes to the security setup

Normally, CMOS setup is needed when the system hardware is not consistent with the information contained in the CMOS RAM, whenever the CMOS RAM has lost power, or the system features need to be changed.

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Default Configuration

Most of the configuration settings are either predefined according to the Load Optimal Defaults settings which are stored in the BIOS or are automatically detected and configured without requiring any actions. There are a few settings that you may need to change depending on your system configuration.

Entering Setup

When the system is powered on, the BIOS will enter the Power-On Self Test (POST) routines. These routines perform various diagnostic checks; if an error is encountered, the error will be reported in one of two different ways:

- If the error occurs before the display device is initialized, a series of beeps will be transmitted.
- If the error occurs after the display device is initialized, the screen will display the error message.

Powering on the computer and immediately pressing <Del> allows you to enter Setup. Another way to enter Setup is to power on the computer and wait for the following message during the POST:

```
TO ENTER SETUP BEFORE BOOT
PRESS <CTRL-ALT-ESC>
Press the <Del> key to enter Setup:
```

Legends

Key	Function
Right and Left arrows	Moves the highlight left or right to select a menu.
Up and Down arrows	Moves the highlight up or down between sub-menus or fields.
<Esc>	Exits to the BIOS Setup Utility.
+ (plus key)	Scrolls forward through the values or options of the highlighted field.
- (minus key)	Scrolls backward through the values or options of the highlighted field.
Tab	Selects a field.
<F1>	Displays General Help.
<F10>	Saves and exits the Setup program.
<Enter>	Press <Enter> to enter the highlighted sub-menu.

Scroll Bar

When a scroll bar appears to the right of the setup screen, it indicates that there are more available fields not shown on the screen. Use the up and down arrow keys to scroll through all the available fields.

Submenu

When "▶" appears on the left of a particular field, it indicates that a submenu which contains additional options are available for that field. To display the submenu, move the highlight to that field and press <Enter>.

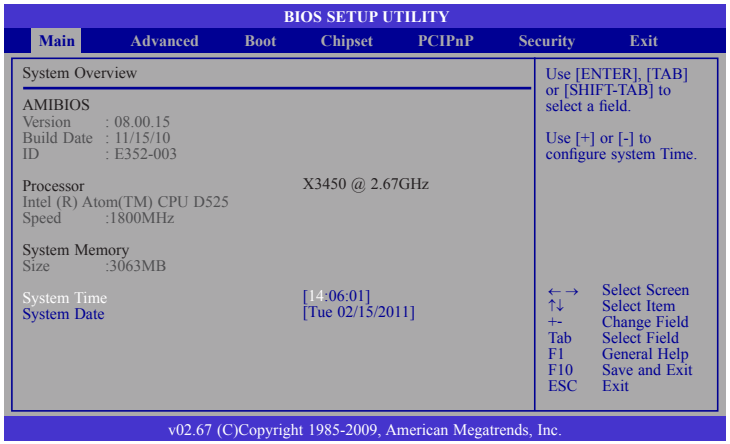
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BIOS Setup Utility

Once you enter the AMI BIOS Setup Utility, the Main Menu will appear on the screen. The main menu allows you to select from six setup functions and one exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the submenu.

Main

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.



AMI BIOS

Displays the detected BIOS information.

Processor

Displays the detected processor information.

System Memory

Displays the detected system memory information.

System Time

The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

System Date

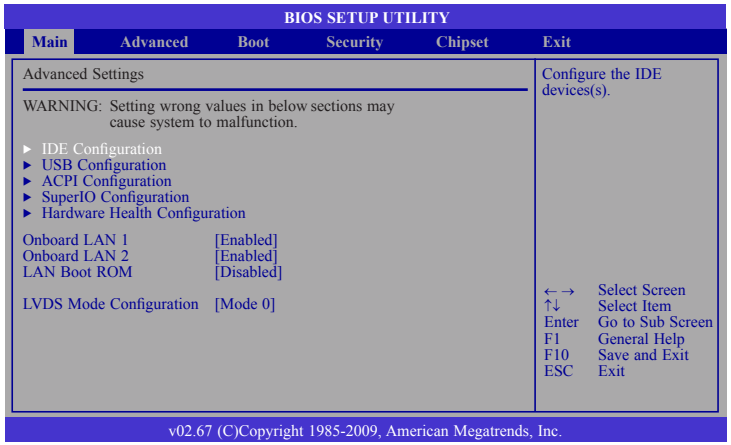
The date format is <day>, <month>, <date>, <year>. Day displays a day, from Sunday to Saturday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 1999 to 2099.

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Advanced

The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

Setting incorrect field values may cause the system to malfunction.



IDE Configuration

This section is used to configure the IDE drives.

USB Configuration

This section is used to configure USB devices.

ACPI Configuration

This section is used to configure the ACPI function.

Super IO Configuration

This section is used to configure the I/O functions supported by the onboard Super I/O chip.

Hardware Health Configuration

This section is used to configure the hardware monitoring events such as the temperature, fan speed and voltages.

Onboard LAN 1 and Onboard LAN 2

Enables or disables the onboard LAN.

LAN Boot ROM

Enable this field if you want to use the boot ROM (instead of a disk drive) to boot-up the system and access the local area network directly. If you wish to change the boot ROM's settings, type the <Shift> and <F10> keys simultaneously when prompted during boot-up. Take note: you will be able to access the boot ROM's program (by typing <Shift> + <F10>) only when this field is enabled.

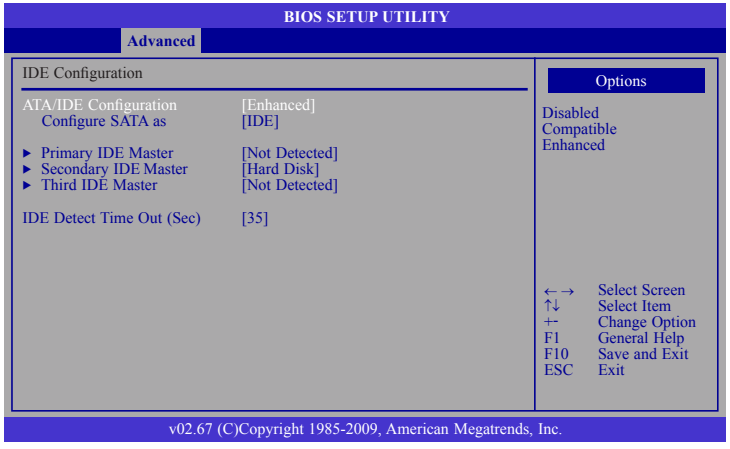
LVDS Mode Configuration

Selects the LVDS mode.

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IDE Configuration

This section is used to configure the IDE drives.



ATA/IDE Configuration

Sets the SATA device to Compatible or Enhanced mode.

Configure SATA As

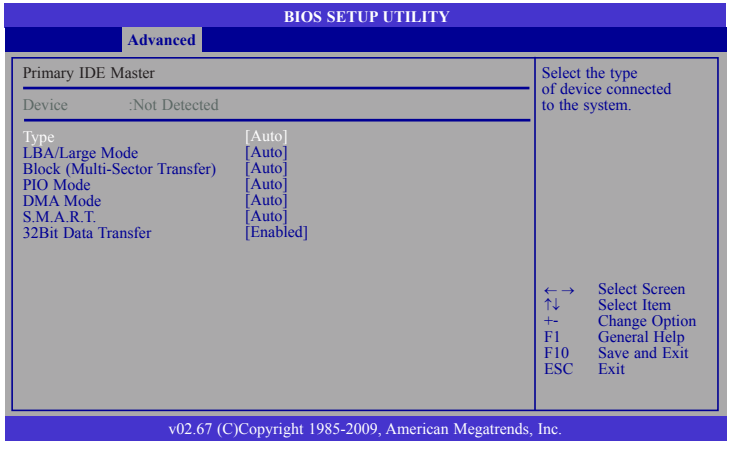
IDE This option configures the Serial ATA drives as Parallel ATA physical storage device.

RAID This option allows you to create RAID or Intel Matrix Storage configuration on Serial ATA devices.

AHCI This option configures the Serial ATA drives to use AHCI (Advanced Host Controller Interface). AHCI allows the storage driver to enable the advanced Serial ATA features which will increase storage performance.

Primary IDE Master to Third IDE Master

When you enter the BIOS Setup Utility, the BIOS will auto detect the existing IDE devices then displays the status of the detected devices. To configure an IDE drive, move the cursor to a field then press <Enter>.



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Type

Selects the type of IDE drive connected to the system.

LBA/Large Mode

Auto	The LBA mode will automatically be enabled, that is, if the LBA mode was not previously disabled.
Disabled	Disables the LBA mode.

Block (Multi-Sector Transfer)

Auto	Data transfer to and from the device occurs multiple sectors at a time.
Disabled	Data transfer to and from the device occurs one sector at a time.

PIO Mode

Selects the data transfer mode. PIO means Programmed Input/Output. Rather than have the BIOS issue a series of commands to effect a transfer to or from the disk drive, PIO allows the BIOS to tell the controller what it wants and then let the controller and the CPU perform the complete task by themselves. Your system supports five modes, 0 (default) to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode after checking your drive.

Auto	The BIOS will automatically set the system according to your hard disk drive's timing.
Mode 0-4	You can select a mode that matches your hard disk drive's timing. Caution: Do not use the wrong setting or you will have drive errors.

DMA Mode

Selects the DMA mode.

Auto	Automatically detects the DMA mode.
SWDMAn	SingleWord DMAn.
MWDMAn	MultiWord DMAn.
UDMAn	Ultra DMAn.

S.M.A.R.T.

The system board supports SMART (Self-Monitoring, Analysis and Reporting Technology) hard drives. SMART is a reliability prediction technology for ATA/IDE and SCSI drives. The drive will provide sufficient notice to the system or user to backup data prior to the drive's failure. SMART is supported in ATA/33 or later hard drives. The options are Auto (default), Enabled and Disabled.

32Bit Data Transfer

Enables or disables 32-bit data transfer.

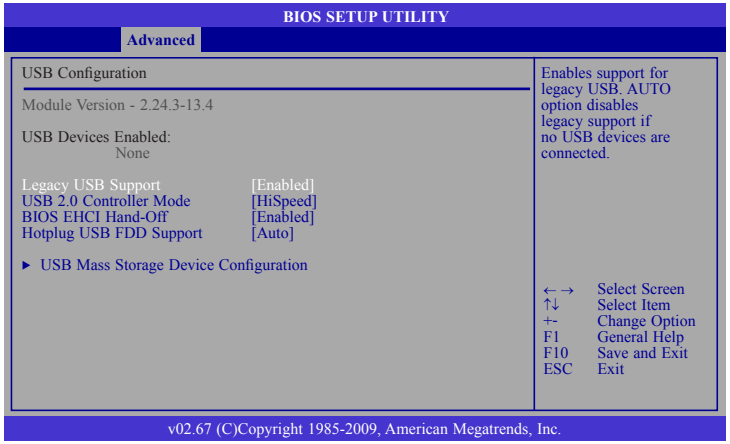
IDE Detect Time Out (Sec)

Selects the time out value for detecting ATA/ATAPI devices.

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USB Configuration

This section is used to configure USB devices.



Legacy USB Support

Due to the limited space of the BIOS ROM, the support for legacy USB keyboard (in DOS mode) is by default set to Disabled. With more BIOS ROM space available, it will be able to support more advanced features as well as provide compatibility to a wide variety of peripheral devices.

If a PS/2 keyboard is not available and you need to use a USB keyboard to install Windows (installation is performed in DOS mode) or run any program under DOS, set this field to Enabled.

USB 2.0 Controller Mode

Sets the USB 2.0 controller mode to HiSpeed (480 Mbps) or FullSpeed (12 Mbps).

BIOS EHCI Hand-Off

Enable this field when using operating systems without the EHCI hand-off support.

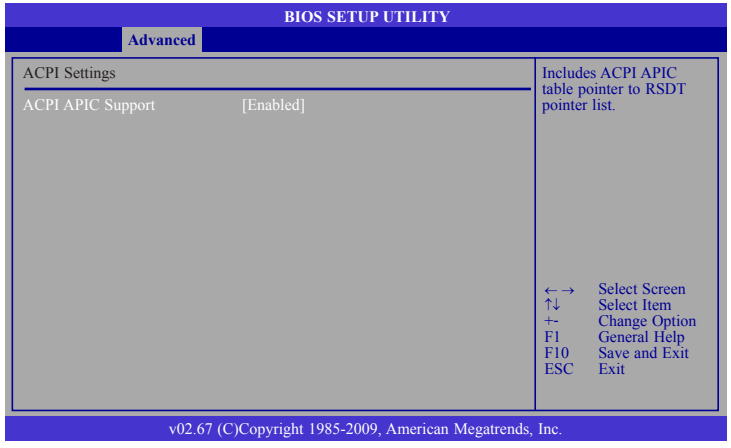
Hotplug USB FDD Support

Enables or disables the USB FDD function.

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ACPI Configuration

This section is used to configure the ACPI configuration.



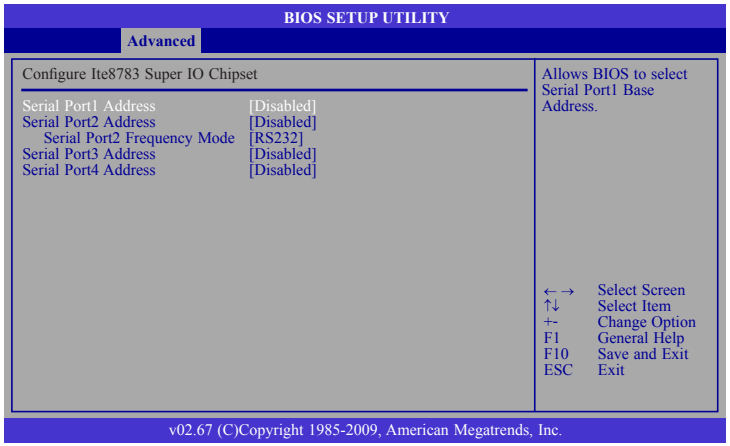
ACPI APIC Support

Enables or disables the ACPI APIC function.

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Super IO Configuration

This section is used to configure the I/O functions supported by the on-board Super I/O chip.



Serial Port1 Address and Serial Port4 Address

Auto The system will automatically select an I/O address for the on-board serial port.

3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3 Allows you to manually select an I/O address for the onboard serial port.

Disabled Disables the onboard serial port.

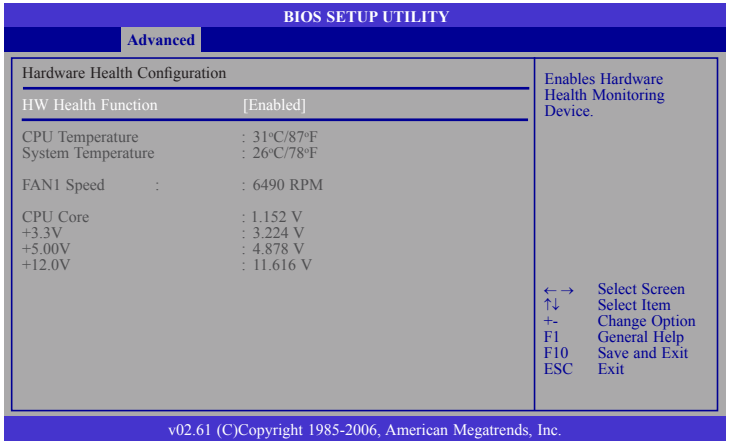
Serial Port2 Frequency Mode

Sets Serial Port2 to function as a serial port or IrDA.

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Hardware Health Configuration

This section is used to configure the hardware monitoring events such as temperature, fan speed and voltages.



CPU Temperature and System Temperature

Detects and displays the current temperature of the CPU, chipset and the internal temperature of the system.

Fan1 Speed

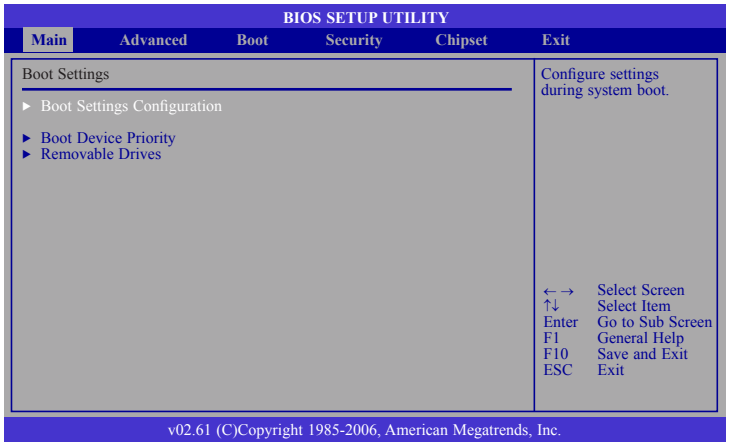
Detects and displays the current fan speed in RPM (Revolutions Per Minute).

CPU Core to +12.0V

Detects and displays the output voltages.

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Boot



Boot Settings Configuration

This section is used to configure settings during system boot.

Boot Device Priority

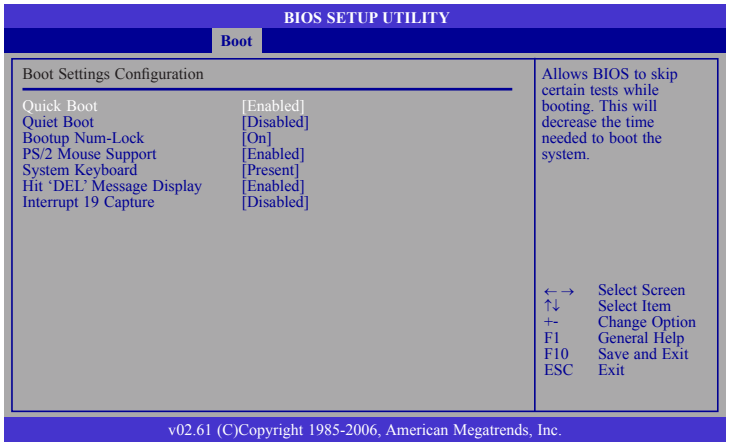
This section is used to select the boot priority sequence of the devices.

Removable Drives

This section is used to select the boot priority sequence of the hard disk drives.

Boot Settings Configuration

This section is used to configure settings during system boot.



Quick Boot

When Enabled, the BIOS will shorten or skip some check items during POST. This will decrease the time needed to boot the system.

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Quiet Boot

Enabled Displays OEM logo instead of the POST messages.
Disabled Displays normal POST messages.

Bootup Num-Lock

This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on wherein the function of the numeric keypad is the number keys. When set to Off, the function of the numeric keypad is the arrow keys.

PS/2 Mouse Support

Enables or disables the PS/2 mouse.

System Keyboard

Detects the presence of the system keyboard.

Hit 'DEL' Message Display

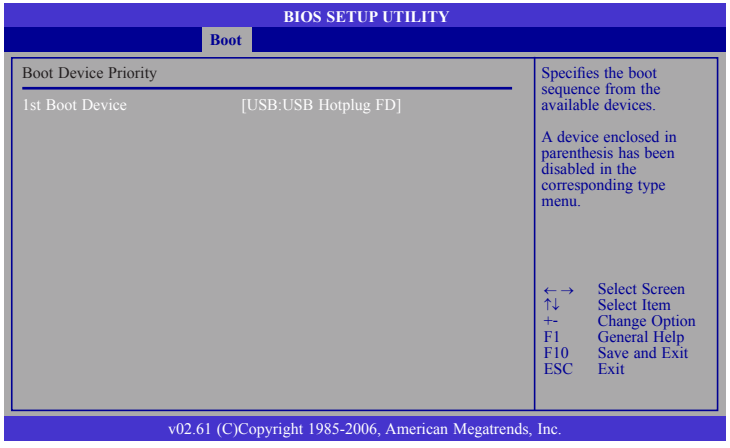
When enabled, the system displays the "Press DEL to run Setup" message during POST.

Interrupt 19 Capture

When enabled, it allows the optional ROM to trap interrupt 19.

Boot Device Priority

This section is used to select the boot priority sequence of all available devices.



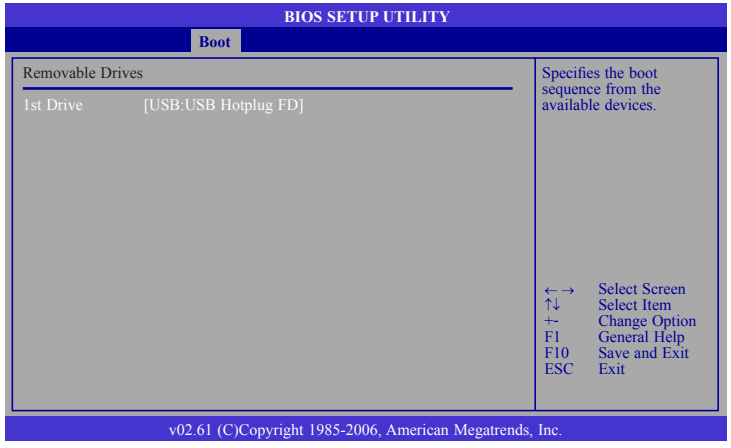
1st Boot Device

The BIOS will boot the operating system according to the sequence of the drive selected.

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Removable Drives

This section is used to select the boot priority sequence of the hard drives.

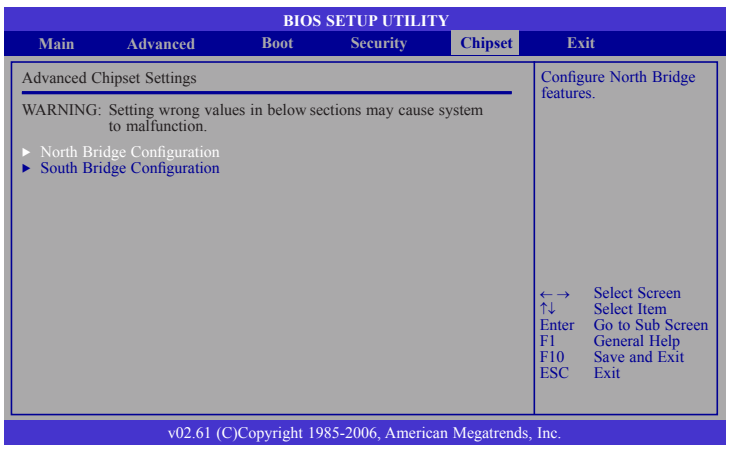


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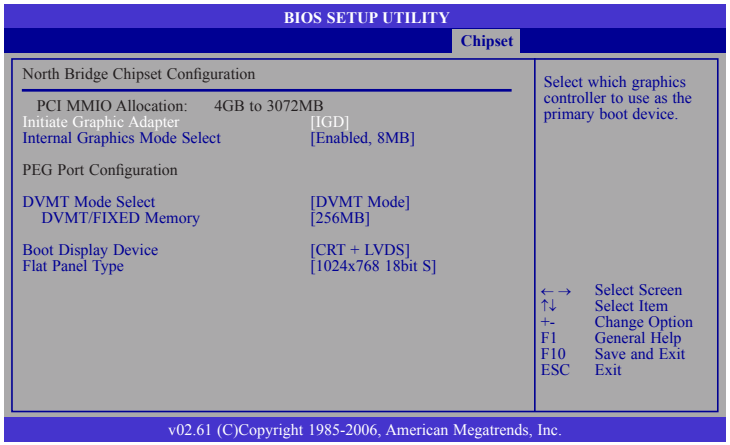
Chipset

This section is used to configure the system based on the specific features of the chipset.

Setting incorrect field values may cause the system to malfunction.



North Bridge Configuration



Initiate Graphic Adapter

Selects the graphics controller to use as the primary boot device.

Internal Graphics Mode Select

Selects the internal graphics mode.

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DVMT Mode Select

Selects the DVMT mode.

DVMT/Fixed Memory

This field is used to select the graphics memory size used by DVMT/Fixed mode.

Boot Display Device

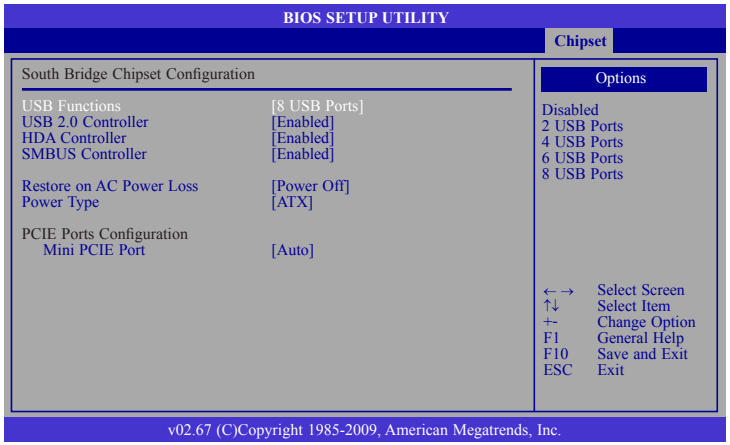
This field is used to select the type of display to use when the system boots.

Flat Panel Type

Selects the type of flat panel connected to the system.

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South Bridge Configuration



USB Functions

Enables or disables the USB ports.

USB 2.0 Controller

This field is used to enable or disable the Enhanced Host Controller Interface controller.

HDA Controller

Enables or disables the onboard audio.

SMBUS Controller

Enables or disables the SMBUS controller.

Restore On AC Power Loss

Off	When power returns after an AC power failure, the system's power is off. You must press the Power button to power-on the system.
On	When power returns after an AC power failure, the system will automatically power-on.
Former-Sts	When power returns after an AC power failure, the system will return to the state where you left off before power failure occurs. If the system's power is off when AC power failure occurs, it will remain off when power returns. If the system's power is on when AC power failure occurs, the system will power-on when power returns.

Power Type

Selects the type of power supply.

Mini PCIE Port

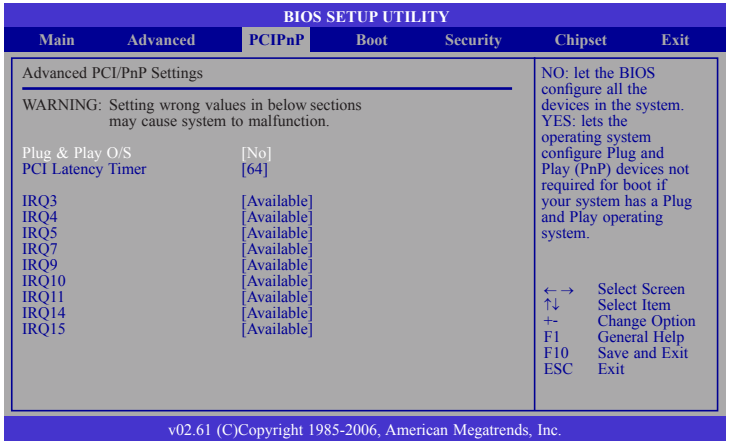
Configures the Mini PCIE port.

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PCIPnP

This section is used to configure settings for PCI/PnP devices.

Setting incorrect field values may cause the system to malfunction.



Plug & Play O/S

Yes Configures Plug and Play (PnP) devices that are not required to boot in a Plug and Play supported operating system.
No The BIOS configures all the devices in the system.

PCI Latency Timer

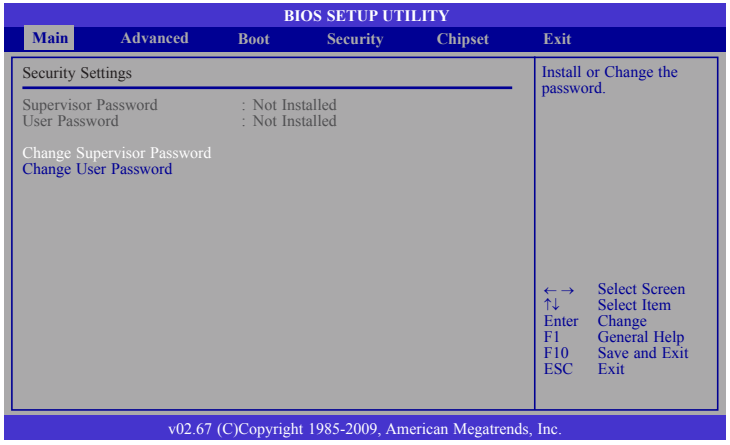
This feature is used to select the length of time each PCI device will control the bus before another takes over. The larger the value, the longer the PCI device can retain control of the bus. Since each access to the bus comes with an initial delay before any transaction can be made, low values for the PCI Latency Timer will reduce the effectiveness of the PCI bandwidth while higher values will improve it.

IRQ3 to IRQ15

Available The specified IRQ is available for PCI/PnP devices.
Reserved The specified IRQ is reserved for Legacy ISA devices.

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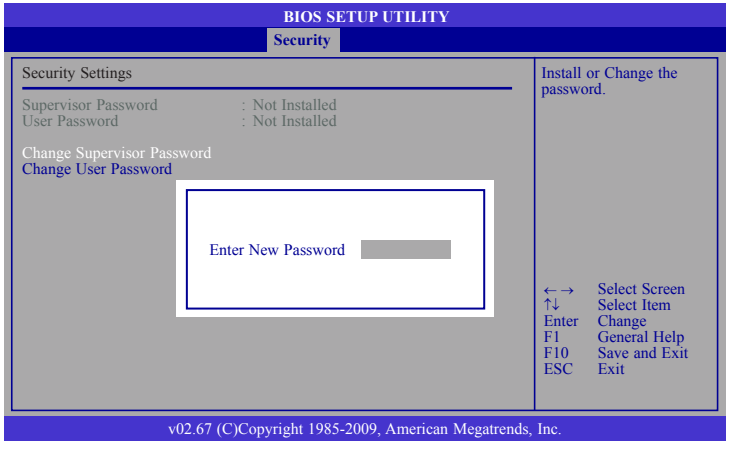
Security



Change Supervisor Password

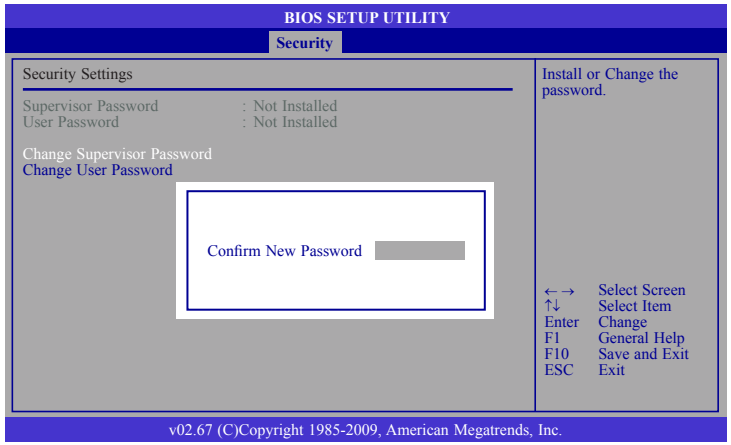
This field is used to set or change the supervisor password. To set a new password:

1. Select the Change Supervisor Password field then press <Enter>.
2. Type your password in the dialog box then press <Enter>. You are limited to eight letters/numbers.

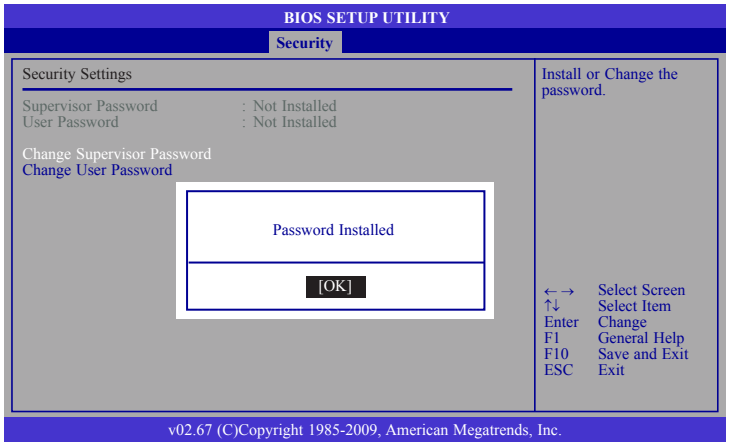


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3. Press <Enter> to confirm the new password.



4. When the Password Installed dialog box appears, click OK.



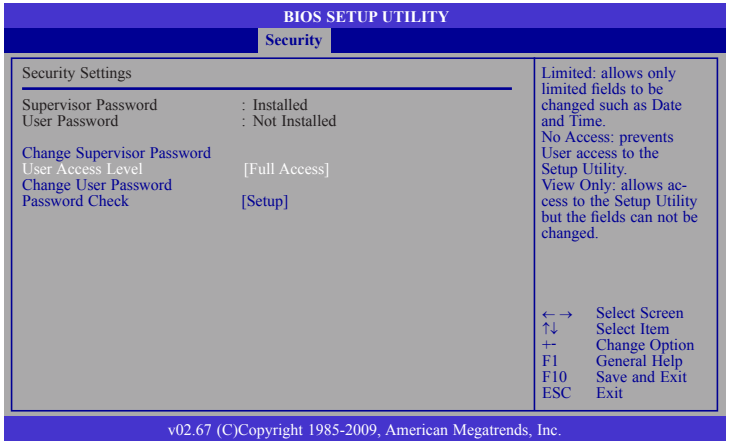
To change the password, repeat the same steps above.

To clear the password, select Change Supervisor Password then press <Enter>. The Password Uninstalled dialog box will appear.

If you forgot the password, you can clear the password by erasing the CMOS RTC (Real Time Clock) RAM using the Clear CMOS jumper. Refer to the Jumper Settings section in chapter 2 for more information.

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After you have set the supervisor password, the User Access Level field will appear.



User Access Level

Selects the access level to the fields in the Setup utility.

Limited
Allows limited change to some fields such as Date and Time.

No Access
Prevents user access to the Setup utility.

View Only
Allows you to view the settings but does not allow you to change the settings.

Full Access
Allows you to change settings to all the fields in the utility.

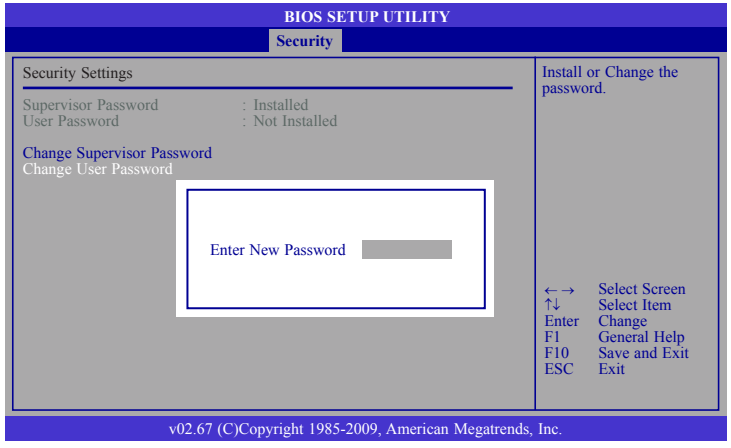
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Change User Password

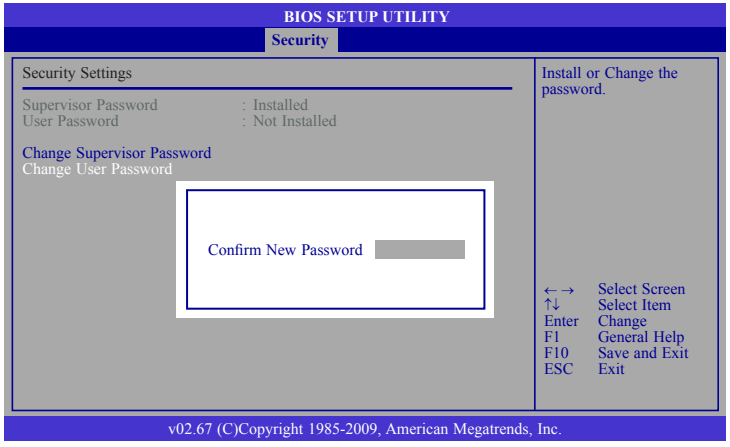
This field is used to set or change the user password.

To set a new password:

1. Select the Change User Password field then press <Enter>.
2. Type your password in the dialog box then press <Enter>. You are limited to eight letters/numbers.

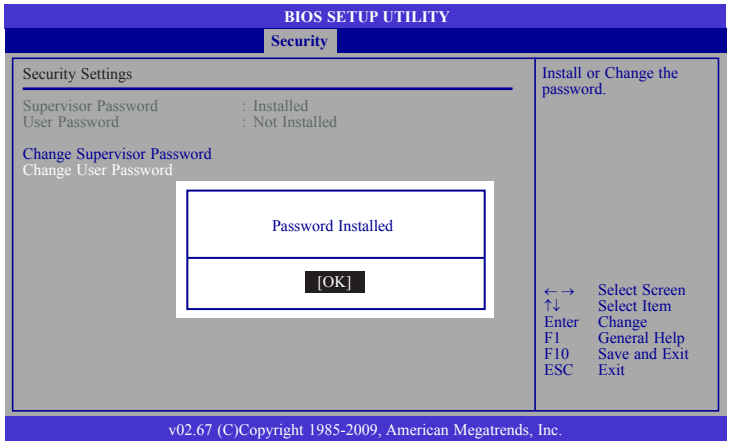


3. Press <Enter> to confirm the new password.



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4. When the Password Installed dialog box appears, select OK.

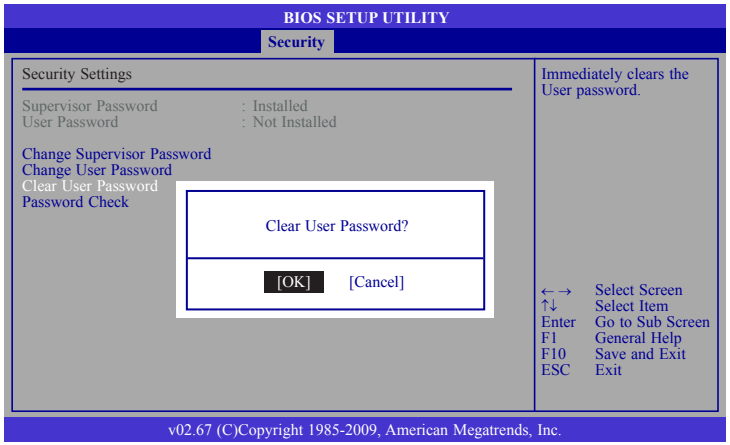


To change the password, repeat the same steps above.

After you have set the user password, the Clear User Password and Password Check fields will appear.

Clear User Password

To clear the password, select Clear User Password then press <Enter>. Click OK.



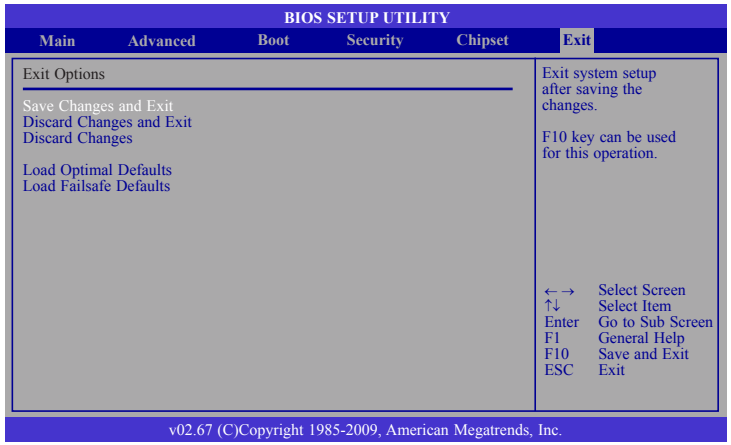
Password Check

Setup
The BIOS checks for the user password whenever accessing the Setup utility.

Always
The BIOS checks for the user password when accessing the Setup utility and booting the system.

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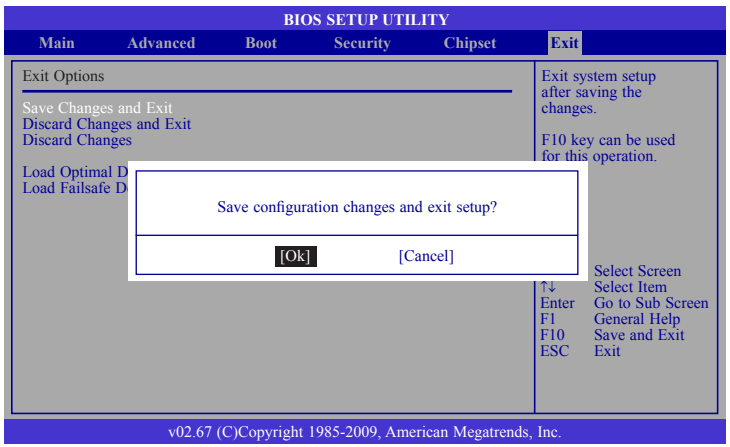
Exit



Save Changes and Exit

To save the changes and exit the Setup utility, select this field then press <Enter>. A dialog box will appear. Confirm by selecting OK.

You can also press <F10> to save and exit Setup.

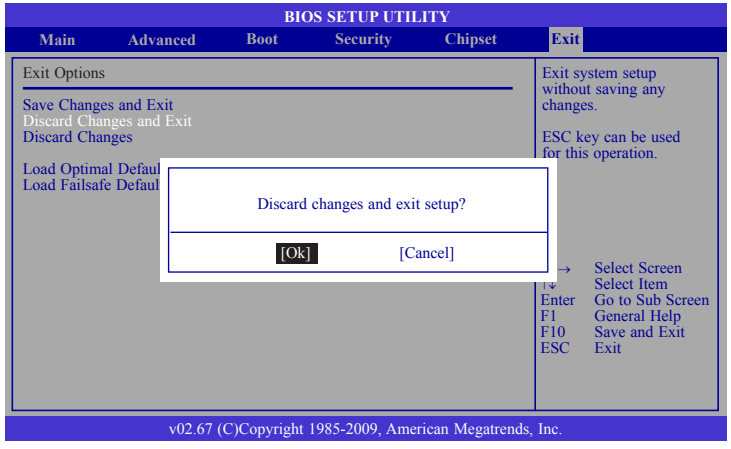


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Discard Changes and Exit

To exit the Setup utility without saving the changes, select this field then press <Enter>. A dialog box will appear. Confirm by selecting OK.

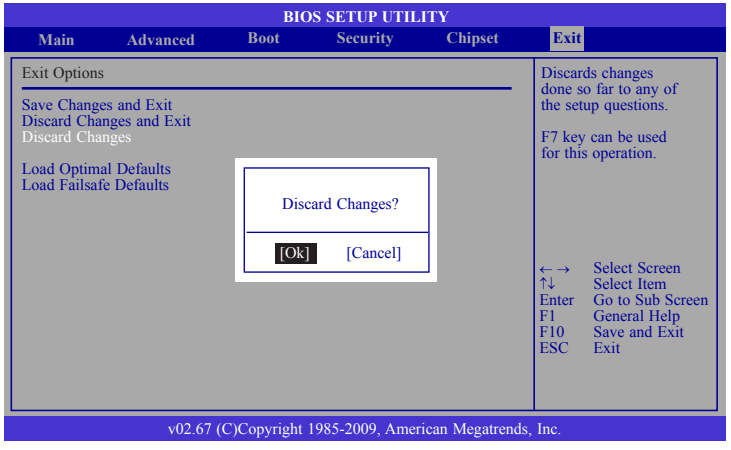
You can also press <ESC> to exit without saving the changes.



Discard Changes

To discard the changes, select this field then press <Enter>. A dialog box will appear. Confirm by selecting OK to discard all changes made and restore the previously saved settings.

You can also press <F7> to discard the changes.

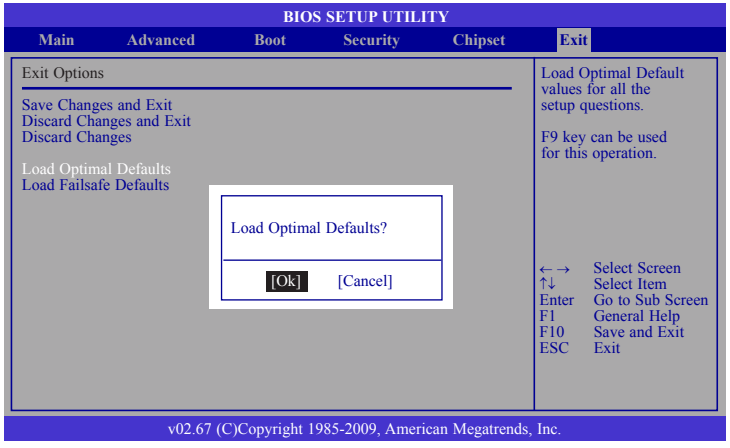


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Load Optimal Defaults

To load optimal default values from the BIOS ROM, select this field then press <Enter>. A dialog box will appear. Confirm by selecting OK.

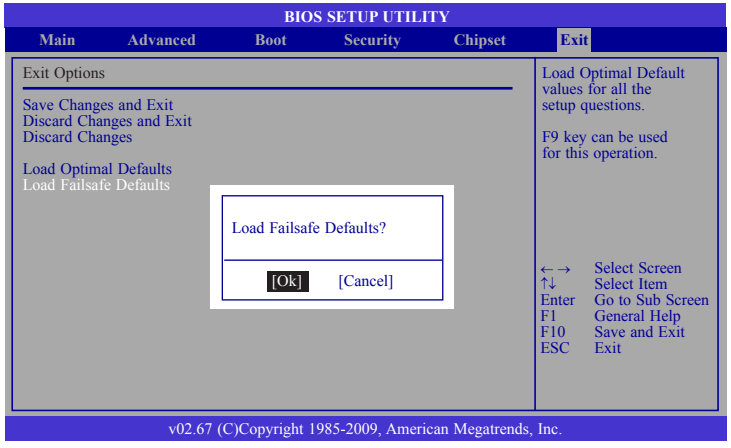
You can also press <F9> to load optimal default values.



Load Failsafe Defaults

To load failsafe default values from the BIOS ROM, select this field then press <Enter>. A dialog box will appear. Confirm by selecting OK.

You can also press <F9> to load failsafe default values.

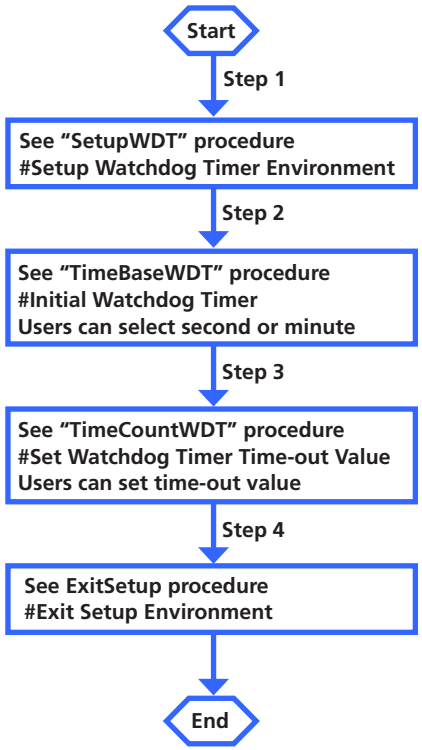


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Appendix A: Watchdog Timer

WDT Programming Guide

EBC 342 Watchdog Function Configuration Sequence Description:



Watch Dog Sample Code

```
#define SUPERIO_PORT    0x2E
#define WDT_SET         0x72
#define WDT_VALUE 0x73

void main(void)
{
  #Enter SuperIO Configuration
        outportb(SUPERIO_PORT, 0x87);
        outportb(SUPERIO_PORT, 0x01);
        outportb(SUPERIO_PORT, 0x55);
        outportb(SUPERIO_PORT, 0x55);

  # Set LDN
        outportb(SUPERIO_PORT,0x07);
        outportb(SUPERIO_PORT+1 ,0x07);

  # Set WDT setting
        outportb(WDT_SET,0xC0);          # Use the second to come down
                                                                  # If
choose the Minute, change value to 0x40
  # Set WDT sec/min
        outportb(WDT_VALUE,0x05);              #Set 5 seconds
```


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Appendix B: GPI/O Programming Guide

GPI/O (General Purpose Input/Output) pins are provided for custom system design. This appendix provides definitions and default settings for the ten GPI/O pins in the EBC 352 series. The pin definition is shown in the following table:

J3 - GPIO Connector

Pin	GPI/O Mode	PowerOn Default	Address	Pin	GPI/O Mode	PowerOn Default	Address
1	VCC	-	-	2	GND	-	-
3	GPO	Low	284h (Bit4)	4	GPI	High	284h (Bit0)
5	GPO	Low	284h (Bit5)	6	GPI	High	284h (Bit1)
7	GPO	Low	284h (Bit6)	8	GPI	High	284h (Bit2)
9	GPO	Low	284h (Bit7)	10	GPI	High	284h (Bit3)

Control the GPO pin (3/5/7/9) level from I/O port 284h bit (4/5/6/7).

The bit Set/Clear indicates output High/Low.

GPIO Programming Sample Code

```
#define GPIO_PORT       0x284
#define GPO3                    (0x01 << 4)
#define GPO5                    (0x01 << 5)
#define GPO7                    (0x01 << 6)
#define GPO9                    (0x01 << 7)

#define GPO3_HI         outportb(GPIO_PORT, 0x10)
#define GPO3_LO                 outportb(GPIO_PORT, 0x00)
#define GPO5_HI         outportb(GPIO_PORT, 0x20)
#define GPO5_LO                 outportb(GPIO_PORT, 0x00)
#define GPO7_HI         outportb(GPIO_PORT, 0x40)
#define GPO7_LO                 outportb(GPIO_PORT, 0x00)
#define GPO9_HI         outportb(GPIO_PORT, 0x80)
#define GPO9_LO                 outportb(GPIO_PORT, 0x00)
void main(void)
{
  GPO3_HI;
  GPO5_LO;
  GPO7_HI;
  GPO9_LO;
}
```

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